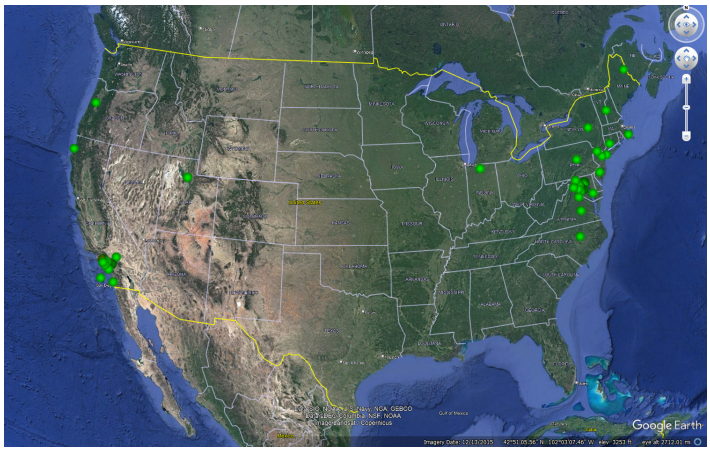
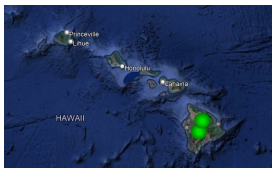
Greenhouse Gas (GHG) Observations Networks

Pioneering GHG Data Measurement for a Greener Tomorrow

AEM operates one of the largest networks of environmental measurement instruments to precisely measure the atmospheric carbon, methane, and other greenhouse gas emissions. AEM's Earth Networks brand collaborated with renowned scientists and organizations to develop robust data reliability standards and methodologies to ensure precise measurement standards including:

- Scripps Institution of Oceanography
- National Oceanic and Atmospheric Administration (NOAA)
- National Institute of Standards and Technology (NIST)
- Integrated Carbon Observation System (ICOS)





AEM Greenhouse Gas (GHG) Observation Network includes 47 GHG measuring instruments in the U.S. with 5 additional sites planned over the next few years.

The AEM GHG Observation Network comprises state-of-the-art detection equipment on tall towers operating under WMO calibration standards and procedures. Sensors at these locations provide continuous in-situ measurements of atmospheric GHG mixing ratios at multiple heights (50 to 300 meters). This continuous measurement provides real-time gap-filling data for improved measurement, reporting and verification (MRV), and other global model output.

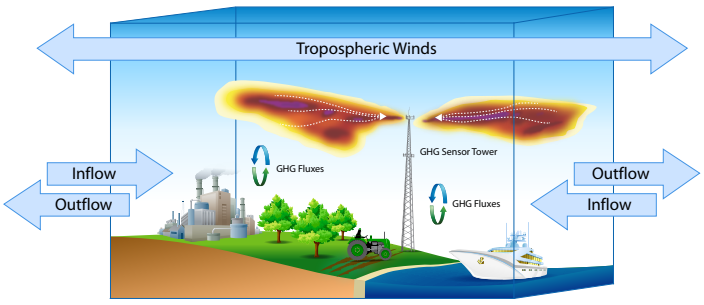
The GHG Observation Network also provides for integration of data from other GHG sensors and networks enabling organizations with increased data density to provide a further return on their capital investment.

Solving the Measurement Dispute with a Top-Down Approach

The GHG Observation Network provides precise, high-density measurements enabling the ability to quantify changes in atmospheric gases on regional scales across the globe. AEM uses a top-down approach to accurately measure atmospheric greenhouse gases, filling the gaps in bottom-up estimates to enable more accurate quantification of emissions that are not directly measured. The data collected by the GHG Observation Network will be combined with weather information from AEM's Global Weather Network to determine how these gases travel utilizing inverse modeling.

AEM GHG Observation Network installation including a Vantage Pro2 weather station and two air sampling lines.

Tracing the Source with Inverse Modeling



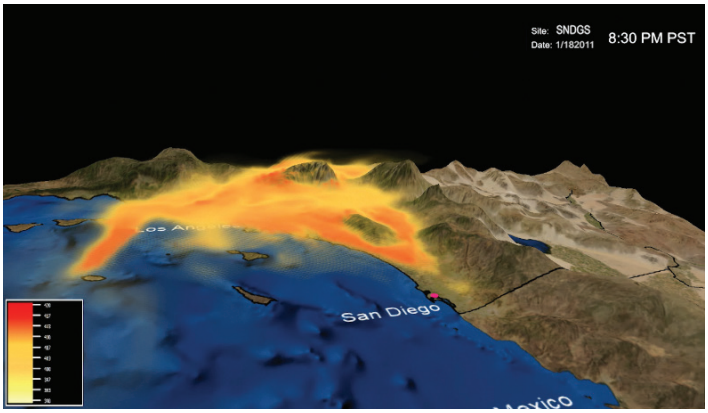
AEM combines continuous atmospheric measurements, and where necessary, utilizes inversions at a coarser scale along with bottom-up GHG estimates from static or dynamic inventories of emissions.

For this analysis, atmospheric trajectories are simulated, based on the Weather Research and Forecasting (WRF) model at high spatial resolution and surface footprints, which are computed using coupled Stochastic Time-Inverted Lagrangian Transport (STILT model).

Advanced Data Models and Carbon Forecasts

Controlling carbon emissions begins with accurate high-density measurement for MRV (measurement, reporting and verification). AEM combines continuous GHG measurements with real-time weather data from our global weather network to create a near-real-time weather and carbon data collection system providing both ground floor data and data on local factors for improved carbon forecasts, as well as in support of advanced data models.

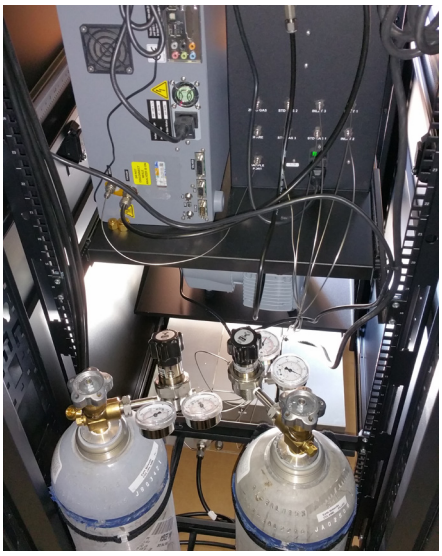
AEM's Global Weather Information Network combines real-time information from 8,000 surface observation stations with multi-source weather observation data.



Carbon forecasts are delivered in 2D and 3D animations on the GHG network portal. Data collected from AEM sensors model carbon dioxide concentration levels and its motion over California.

AEM Greenhouse Gas Observation Solutions Benefits

- Continuous measurement providing near-real-time gap filling data for carbon tracker and other global models
- High quality calibration tanks from the National Oceanic and Atmospheric Administration (NOAA) meeting WMO standards
- MRV foundations at national, regional, and local scales supporting climate and GHG reduction policies and regulations, as well as emerging carbon trading programs
- Education of the public on climate changes and the role of GHGs



Earth Networks, an AEM brand, and Scripps Institution developed a system for calibrating gas analyzers and function monitoring. The system includes a calibration box and two air tanks.

AEM GHG Observation Network Site and Data Services

AEM provides cost effective solutions that ensure accurate continuous measurement which meet WMO standards. Our complete turnkey solution also offers flexible options to complement existing sensor installations.

Network site and data services include:

- Site planning and consultation
- Instrument installation
- Calibration system
- Site maintenance
- Weather station
- Data management services
- GHG data display on the GHG network portal
- Carbon footprint reports